

INFRASTRUCTURE CASE STUDY:

Rapid Bridge Replacement

SUMMARY

PROJECT TYPE	YEAR
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Multiple bridges	2017
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DEAL STRUCTURE

Design-build-finance-maintain agreement

TOTAL COST

\$1.1 billion for construction and 25 years of maintenance

FINANCING

PABs and private equity

FUNDING

Mobilization, milestone and availability payments from PennDot; general revenues; and interest earned

PUBLIC BENEFIT

Replacement of structurally deficient/unsafe bridges



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Background

In 2012, the state of Pennsylvania enacted Act 88, which created a new system for how P3s can be used to deliver transportation infrastructure.¹ This created the P3 Board of Pennsylvania's Department of Transportation (PennDOT), which signed the contracts for the Rapid Bridge Replacement Project. The project will rebuild 558 small bridges throughout the state starting in 2015 and finishing by the end of 2017. The major parties to this project are PennDOT and the master contractor, Plenary Walsh Keystone Partners, a consortium of companies specializing in large infrastructure projects, including delivery, financing, and long-term project management, in partnership with local construction companies. The partnership will last 28 years, with 42 months of construction and 25 years of contracted maintenance.² The other key stakeholders in this process are the local governments where these bridges are located.

Project Description

The bridges were selected out of the more than 4,350 structurally deficient bridges in the state. The bridges that were selected are all in need of replacement or have limited size, length, and number of lanes.

The bridges were also selected based on a series of deliverability considerations, including minimizing disruption to the public; minimizing changes to existing alignment; maintaining existing profiles; limiting impact to utilities, waterways, and other users; and minimizing environmental impact. Through this process, more than 2,000 bridges were screened and 900 were found eligible. These were then ranked and prioritized by urgency, how well they passed the screening requirements, and their availability for construction in 2015 and 2016.³

The project is being executed with a design, build, finance, and maintain model. The private company, Plenary Walsh, has 42 months to replace the bridges. The construction period will be financed by \$721.5 million in private activity bonds (PABs)—the largest PAB issuance in the history of the federal program⁴ — \$59.4 million in equity from Plenary Walsh, \$224.7 million in mobilization and milestone payments, \$35.8 million in availability payments, and \$4.9 million in interest earned.⁵ The mobilization and milestone payments are paid by PennDOT to facilitate the construction process.⁶ The state will then pay Plenary Walsh through performance-based payments that allow PennDOT to ensure an optimal product.⁷ Paying an average of \$60 million per year over the length of the contract, these bridges will take up 2.5 percent of the department's annual investment in roads and bridges. The state will keep ownership of the bridges throughout the contract.

Benefits and Criticisms

The major benefit to PennDOT in this partnership is the ability to quickly complete critically needed infrastructure upgrades throughout the state simultaneously. Pennsylvania has an extensive networks of rural roads, and thus bridges, many of which are 30 to 40 years past their useful life. This project will address a sizeable portion of the 4,000 structurally deficient bridges in the state. Logistically, this would likely take ten to 15 years for PennDOT to complete on its own. Instead, the private partners are assuming the construction risk and can better mobilize a large-scale construction effort than the resource-constrained PennDOT. Moreover, the efficiencies inherent in bundling numerous projects together will save taxpayers 30 percent of what it would usually cost to replace. The average cost of construction and 28 years of maintenance for each bridge in the P3 contract is \$1.6 million. PennDOT estimates that their cost would have been more than \$2 million through a standard process.

The plan is not without risks, however. One way that Plenary Walsh can make a profit is by keeping costs low. Because Plenary Walsh is only responsible for 25 years of maintenance, out of a 100-year lifespan, there could be an incentive to create bridges that function best over only the first quarter of their lifespans. The performance-based payments could be a solution to this, if the state is watchful in its bridge inspections and ensures that the bridges are still structurally sound toward the end of the 25 years.

Takeaways

The Rapid Bridge Replacement Project is an example of the way innovative P3s can be used to deliver even small-scale infrastructure projects faster and cheaper than the traditional design-bid-build process. By choosing small spans and relying on prefabricated components, bundling a larger number of similar projects, and relying on a private entity with the ability to quickly execute the project, Pennsylvania will see a sizeable reduction of the number of structurally deficient bridges in the state over a very short period of time. While this model does not work for projects necessitating complex design (e.g., large bridges), in situations with a large number of small, similar projects, economies of scale make this a good strategy because the private actor is better equipped to ramp up production than the state agency. PennDOT also greatly benefits by having a contractually obligated set amount to pay for these bridges every year for the next 25 years, regardless of the construction or maintenance issues that arise.

Endnotes

1. Pennsylvania State Code, July 5, 2012. <http://www.legis.state.pa.us/WU01/LI/LI/US/HTM/2012/0/0088..HTM>.
2. Pennsylvania Department of Transportation, Rapid Bridge Replacement Project, DBE Information/Networking Session. http://www.dot.state.pa.us/public/Bureaus/Press/P3/PennDOT_DBE_Presentation_RBR.pdf.
3. Ibid.
4. U.S. Department of Transportation, Federal Highway Administration, "Private Activity Bonds: Transportation Finance Innovations," Fact Sheet. http://www.fhwa.dot.gov/ipd/fact_sheets/pabs.aspx.
5. U.S. Department of Transportation, Federal Highway Administration Project Profiles, "Project Profiles: Pennsylvania Rapid Bridge Replacement Project." http://www.fhwa.dot.gov/ipd/project_profiles/pa_rapid_bridge.aspx.
6. Pennsylvania Department of Transportation, "The Pennsylvania Rapid Bridge Replacement Project: Public-Private Transportation Partnership Agreement," August/September 2014. <http://www.penndot.gov/ProjectAndPrograms/p3forpa/Documents/Public%20Private%20Partnership%20Agreement.pdf>.
7. Plenary Walsh Keystone Partners, Pennsylvania Department of Transportation, Pennsylvania Rapid Bridge Replacement Project. <http://parapidbridges.com/whatisthepennsylvaniaibrproject.html>.



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